DOCUMENT NUMBER 5155

NO FURTHER ACTION DETERMINATION

CFA-27 CFA FUEL OIL TANK AT CFA 669 (CFA-740)
OPERABLE UNIT 4-03

WAG 4

DECISION DOCUMENTATION PACKAGE
COVER SHEET

PREPARED IN ACCORDANCE WITH

TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY SITES
AT INEL

SITE DESCRIPTION: Underground Storage Tank CFA-740
SITE ID: CFA-27 **OPERABLE UNIT:** 04-03
WASTE AREA GROUP: 4

I. SUMMARY - PHYSICAL DESCRIPTION OF THE SITE:

CFA-27 is the historical site of a 15,000 gal. underground storage tank designated CFA-740. The tank was used to store fuel for heating of Building CFA-669, the old CFA laundry facility. The tank was installed in 1953 when operations began and taken out of service in 1981 when the laundry facility was moved to another building. The tank contents were sampled and analyzed in May 1989 and determined to be #2 diesel fuel. The contents were pumped from the tank in October 1990 by a contracted petroleum company for fuel recovery. Less than 0.5 in. were left in the bottom of the tank.

Tank removal was initiated in October 1990. Volatile organic compounds (VOCs) were monitored with a photoionization detector and found near the fill pipe during excavation at approximately 6 ft below grade. It was apparent that the piping into the building had been leaking. The contaminated soil was removed and placed aside for transport to the CFA landfill for landfarming. Tank removal was completed and biased soil samples were collected for analysis. Field VOC readings determined the soil samples to be far below EG&G Idaho field action levels of 50 ppm for diesel and the pit was backfilled with original noncontaminated soil.

The soil samples were analyzed by a contracted laboratory. Analyses indicated slight contamination in one sample collected near the fill pipe. The total petroleum hydrocarbon (TPH) content of this sample was detected at 1100 ppm, slightly above the regulatory maximum established by the State of Idaho of 1000 ppm for TPH-diesel, and very low levels of benzene, toluene, ethylbenzene, and xylene (BTEX) were detected. One other sample was found to contain less than the regulatory maximum for TPH with no detection of BTEX.

Upon excavation, the tank was observed in good condition, with no signs of leakage. The piping into the building had been leaking and contaminated soil was field screened and removed. Field screening of the soil samples taken from the tank bed detected VOC levels considerably lower than the conservative action levels set by EG&G Idaho. Based on these factors the excavation was determined acceptable for backfilling. However, based on laboratory analyses, it is possible that some contaminated soil was left in the excavation upon backfilling.

DECISION RECOMMENDATION

II. SUMMARY - QUALITATIVE ASSESSMENT OF RISK:

Nearly all of the information gathered is regarded as reliable and the overall qualitative risk assessment is low. The information collected by tank removal and sampling personnel during the removal process was done following documented procedures and no conflicting information was encountered. Comparing these conclusions regarding risk and reliability using the Qualitative Risk and Reliability Evaluation Table, it is determined that no further action is required for CFA-27.

III. SUMMARY - CONSEQUENCES OF ERROR:

If the decision is made in error to close CFA-27, the possibility exists for contaminant migration to groundwater. The contaminants include benzene, ethylbenzene, toluene, xylene, and hydrocarbons in the form of diesel fuel #2, #5, or #6. As a worst case scenario, if the entire volume of the tank had leaked into the surrounding soil, the estimated volume of the contaminant source is 1,298.7 yd^3 for light diesel fuel and 974.0 yd^3 for heavy diesel.

In the event that CFA-27 poses no environmental threat and a decision is made in error to remediate the site, the realized benefits would be minimal relative to a high investment in clean-up expenditures.

IV. SUMMARY - OTHER DECISION DRIVERS

Laboratory results from one soil sample of six analyzed from the tank excavation detected TPH levels at 1100 ppm, slightly above the regulatory maximum allowable of 1000 ppm.

RECOMMENDED ACTION:

COCA Site CFA-27 should be considered for reclassification to "no-action" status and removed from the list of INEL solid waste management units. The information gathered is reliable, and the level of risk associated with this site is low. TPH was detected only in one soil sample collected near the fill pipe, which is a region where previous fuel leakage was observed during removal of the tank. The level of TPH was slightly above the maximum allowed by the State of Idaho and considering the migration pathway of TPH, poses a low risk to groundwater. BTEX in this sample was detected at very low levels and have possibly volatilized, also posing a low risk to groundwater. Other contaminated soil was removed following established procedures and the tank was removed eliminating the possibility of any further contamination occurring. Further remediation at this site would require funding which could realize more benefit in other areas.

SIGNATURES	# PAGES:	DATE: 11/21/91
Prepared By: J. Benson		DOE WAG Manager:
Approved By:		Independent Review: Shannon Wiley

NO FURTHER ACTION DETERMINATION

The U.S. Department of Energy, the U.S. Environmental Protection Agency-Region 10, and the State of Idaho have completed a review of the referenced information for CPA-27 hazardous waste site, as it pertains to the INEL Federal Facility Agreement of 12/4/91. Based on this review, the Parties have determined that no further action for purposes of investigation or study is justified. This decision is subject to review at the time of issuance of the Record of Decision. Brief summary of the basis for no further action:

References:

DOE Project Manager _____ 1/16/92 Date

EPA Project Manager _____ 1/16/92 Date

Idaho Project Manager _____ 1/16/92 Date

DECISION STATEMENT
(BY ~~STATE~~ RPM)
DOE

DATE RECD: 1/16/92

DISPOSITION:

- Significant lead remained - indicate tank integrity
- tank contents removed
- tank removed
- disturbed soil removed
- tank contents sample below hazardous waste levels
- soil samples below risk levels

conclusion — no further action warranted

DATE: 1/16/92	**# PAGES (DECISION STATEMENT)** 1
NAME: Jerry Lyle	**SIGNATURE:**

DECISION STATEMENT
(BY EPA RPM)

DATE RECD: 1/16/92

DISPOSITION:

CFA-27 UST CFA 740

Based on 10" heel & limited soil sampling showing BTEX low and Cl < 1000 ppm in tank contents and Diesel #2 being fuel and 15,000 gal tank and surrounding soil removed No basis for further actio

References

#6 not signed

#8 actual date 18th

#10 Gift, MJ Aug 1990

#14 Lugar, RH INEL Tank Clos Prog SADP for Tank Contents, May 1989

Note 1000 ppm RCRA HW desig for used oil

DATE: 1/16/92	**# PAGES (DECISION STATEMENT)** 1
NAME: Wayne Pein	**SIGNATURE:** Wayne Pein

DECISION STATEMENT
(BY STATE RPM)

DATE RECD: 1/16/92

DISPOSITION:

State has reviewed the background information provided in the references in this document to determine if further action at this unit is warranted. From this information which includes actual sample results and field log book, no further action is required. This determination will be reviewed at the time of the WAG-wide ROD for inclusion in the final decision after public comment.

Other Observations:

- Tank contents ~~is not~~ was not a hazardous waste.
- contaminants are at or below detection levels
- Concentrations do not pose a risk.

DATE: 1/16/92	**# PAGES (DECISION STATEMENT):**
NAME: Dean J. Nygaard	**SIGNATURE:** Dean J. Nygaard

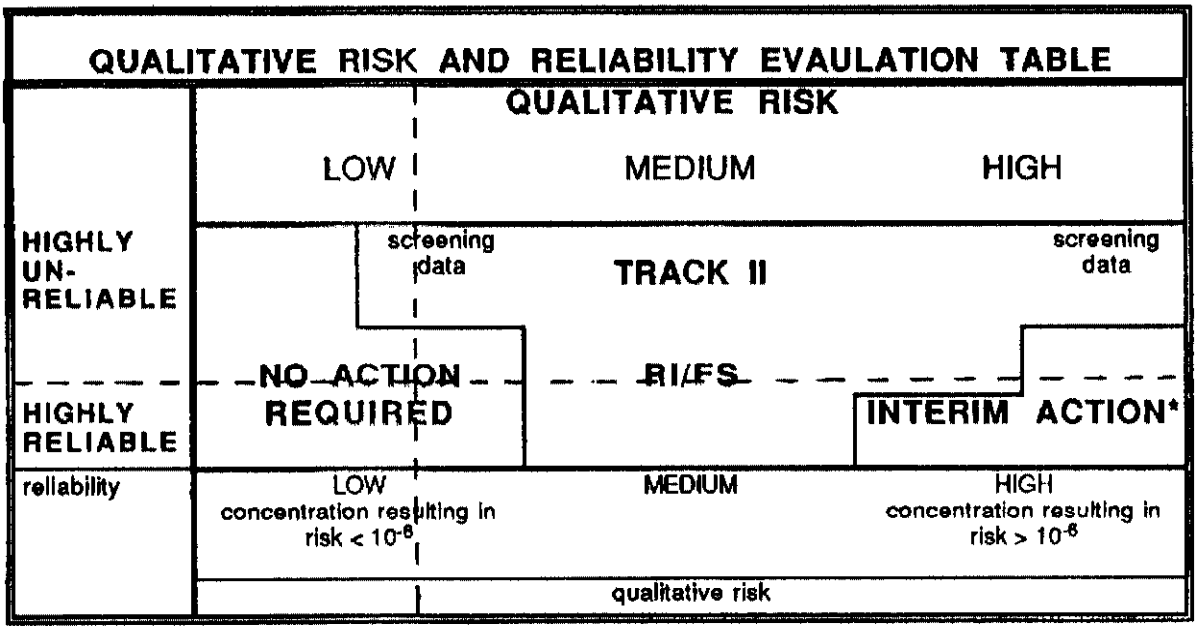
PROCESS/WASTE WORKSHEET
SITE ID CFA-27

col 1 Processes Associated with this site	col 2 Waste Description & Handling Procedures	col 3 Description & Location of any Artifact/Structures/Disposal Areas Associated with this Waste or Process
Process Diesel fuel #2 storage in an underground storage tank (UST) CFA-740	660 gal. of #2 diesel fuel recovered by H&M Oil of Pocatello, ID	Artifact Location Description
		Artifact Location Description
		Artifact Location Description
Process Removal of UST CFA-740		Artifact Underground storage tank Location Now removed, previously located 10 ft northwest of CFA-669 Description 15,000 gal steel tank
		Artifact Associated piping Location Now removed, previously located with tank northwest of CFA-669 Description Tar-coated steel
		Artifact Contaminated soil Location Near fill pipe of UST previously located at CFA-669 Description Soil with TPH levels higher than State of Idaho maximum
Process		Artifact Location Description
		Artifact Location Description
		Artifact Location Description

CONTAMINANT WORKSHEET
SITE ID CFA-27
PROCESS (col 1) **UST** **WASTE** Soil

Col 4 What known/potential hazardous substances/constituents are associated with this waste or process?	Col 5 Potential sources associated with this hazardous material?	Col 6 Known/estimated concentrations of hazardous substances/ constituents[a]	Col 7 Risk based concentration mg/kg	Col 8 Qualitative risk assessment (Hi/Med/Lo)	Col 9 Overall reliability (Hi/Med/Lo)
Benzene	Contaminated Soil	ND,DL= 0.05	7.71 x 10E-2	Low	High
Toluene	Contaminated Soil	0.06	5.66 x 10E+2	Low	High
Ethylbenzene	Contaminated Soil	0.05	7.48 x 10E+2	Low	High
Xylene	Contaminated Soil	0.1	1.26 x 10E+4	Low	High
TPH	Contaminated Soil	1100	—	Low	High

a. ND = not detected
DL = detection limit in ppm



* if there exist sufficient data to identify an appropriate remedy

Question 1. What are the waste generation process locations and dates of operation associated with this site?

Block 1 Answer:

COCA Site CFA-27 is the location of a removed underground storage tank designated as CFA-740. The capacity of the tank was originally believed to be 18,000 gal., however, upon removal of the tank, actual dimensions were obtained and the volume calculated to be 15,000 gal. The carbon steel tank was installed in 1953 at the northwest corner within 10 ft of Building CFA-669 to store heating fuel. CFA-669 was used for CFA laundry operations until 1981, when the laundry facility was moved to another building. The tank was taken out of use when the facility was moved. Records indicate that the tank had no internal protection, but the outside surface was painted for external protection. The associated piping was made of tar-coated steel. When operating, the tank was filled by an above ground pump. Building CFA-669 is now vacant with no plans for future use.

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The sources used are compilations of existing INEL technical documents and anecdotal information from employees involved in INEL activities.

Block 3 Has this INFORMATION been confirmed? _X_Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Visual inspection upon removal of the tank in October 1990 verified the existence, size and location of the tank. Analytical data verified the contents.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	2
Anecdotal	[X]	5	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	5, 9			

Question 2. What are the disposal process locations and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

In May 1989, the tank contents were sampled for waste profile analysis and concluded to contain weathered #2 diesel fuel. EG&G Idaho Environmental Technology (ET) personnel measured the level of contents at 10 in. in the tank. In October 1990, prior to tank removal, 660 gal. of #2 diesel fuel were pumped from the tank for fuel recovery by a local oil company. Less than 0.5 in. of liquid was left in the tank.

Tank removal was initiated October 17, 1990 following EG&G Tank Management Program removal procedures. Volatile organic compound (VOC) readings were taken by ET personnel using a photoionization detector (PID) throughout the excavation process. Near the fill pipe, approximately 6 ft below grade, field readings detected VOC levels at twice the EG&G Idaho field action levels of 50 ppm for diesel. As per removal procedures, this soil was separated from noncontaminated soil until the excavation was completed and then taken to the CFA landfill for landfarming. Excavation resumed October 22, 1990 with VOC readings around the fill pipe initially detecting 52 ppm, but at a depth of 9 ft, readings were well below the action levels. The tank was then removed and observed to be in good condition, with no visible leakage from the tank. It was observed, however, that the piping into the building had been leaking. It was also noted by the Job Site Supervisor that heating pipes were present with this tank. This type of heating apparatus historically was needed when #5 or #6 diesel fuel were used for heating. These types of fuel are known as "heavy" fuels and must be heated in order to reduce viscosity and induce flow. The presence of these heating pipes suggest that at some earlier period, the tank was used to store a heavy diesel fuel.

On the day of removal, biased soil samples were taken by ET personnel from the tank bed, approximately 9 ft below grade. Sample locations are shown on the attached diagram. The bed was scooped with a heavy equipment bucket and the samples collected directly from this soil. Field VOC readings of the samples were taken during collection, with readings below the EG&G field action levels. Based on the condition of the tank and the field VOC readings of the samples, the excavation was determined acceptable for backfilling and was done with original noncontaminated soil.

Laboratory analyses of the soil samples were performed by Data Chem, Inc. of Salt Lake City, UT for total petroleum hydrocarbon (TPH) content and levels of benzene, toluene, ethylbenzene and xylene (BTEX). Of the six samples analyzed, four samples were found noncontaminated while one sample was found to contain found to contain TPH at 1100 ppm, slightly above the State of Idaho maximum allowable of 1000 ppm. BTEX in this sample were at very low levels. An additional sample also contained TPH, but at levels well below maximum and no BTEX. Sampling records indicated that these samples were taken from near the fill pipe. The laboratory detection limits for these constituents are 0.05 ug/g for benzene, toluene, and ethyl benzene; 0.1 ug/g for xylene; and 0.01 mg/g for TPH-diesel.

The tank was cut up in November 1990 and the steel pieces shipped in December 1990 to Pacific Steel of Idaho Falls, Idaho for disposal. The shipment included 4 pieces of piping.

Question 2. What are the disposal process locations and dates of operation associated with this site? How was the waste disposed? (Continued)

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information was obtained from records documenting the disposal process and anecdotal information from personnel directly involved in the removal process.

Block 3 Has this INFORMATION been confirmed? _X_Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Several different sources verify this information.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	2
Anecdotal	[X]	7	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[X]	4	Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1, 10, 12			

Question 3. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

No evidence exists of migration.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Evidence of migration would have been documented in sampling or project logbooks.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

More than one source plus anecdotal information confirm the conclusion of no migration.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[X]	8	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1, 12			

Question 4. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

Sample analyses indicate TPH in one sample at slightly higher levels than the maximum allowable established by the State of Idaho. This sample was taken from the bottom of the excavation near the fill pipe. Field VOC readings of all samples detected levels well below the EG&G Idaho field action level of 50 ppm for diesel and thus the site was determined acceptable for backfilling. However, based on the sample analyses, some contamination was still present. Consequently the excavation may have been backfilled when some TPH was still present.

Block 2 How reliable is/are the information source/s? X High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

This information was obtained from field log books documenting the removal process and sample analytical data.

Block 3 Has this INFORMATION been confirmed? __Yes X No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Data from analytical laboratory has not been validated.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	2
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1, 10			

Question 5. Does the site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

The pattern of contamination is determined to be a hot spot around a leak in the tank or fill pipe.

Block 2 How reliable is/are the information source/s? X High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

This information is based on past experience with leaking tanks.

Block 3 Has this INFORMATION been confirmed? X Yes __No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Consultations with additional EG&G Idaho individuals knowledgeable about tanks and tank leakage.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

The dimensions of the contaminated region were calculated from the known volume of the tank and estimates of the tank dimensions. The dimensions were determined to be: length: 25 ft, width and depth, 10 ft. Based on the properties of #2, #5, and #6 fuel oils, contaminated regions vary in size. For #2 fuel oil (a "light" fuel oil), an area of 1,300 yd^3 of soil is estimated as contaminated and for #5 and #6 fuel oils ("heavy" fuel oils), an area of 970 yd^3 is estimated as contaminated. These contaminated regions are considered the volume of the source. The estimates were calculated using a model developed by EG&G Idaho (attached).

Block 2 How reliable is/are the information source/s? _X_High __Med __Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

Tank volume is known and the model was developed using documented values.

Block 3 Has this INFORMATION been confirmed? __Yes _X_No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Confirmation of these estimates could only be attained by an actual contaminated region from a spill of this magnitude.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	2
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1, 13			

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

An estimate for the quantity of hazardous substance at this source is the capacity of the tank, 15,000 gal. This is assuming that one tank quantity leaked from the piping during the time period the tank was in the ground. This estimate is highly conservative based on the amount of visibly contaminated soil encountered during the removal process.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information used to derive this worst-case scenario was obtained from documentation recorded during the removal process.

Block 3 Has this INFORMATION been confirmed? X Yes _No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

The information used has been confirmed by different sources who were present during the removal process and visually inspected the tank and excavation upon removal of the tank.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[ ]	
Anecdotal	[X]	6	Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[X]	
Summary documents	[X]	11	Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[X]	1,9			

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Samples analyzed at the time of the removal detected TPH at the bottom of the tank excavation in the region where the fill pipe was located. Based on the chemical nature of TPH, it is assumed that any TPH in the soil at that time of sampling is present today. The levels of BTEX in this sample were very low; these amounts could still be present in the soil or could have volatilized since sampling.

Block 2 How reliable is/are the information source/s? X High _Med _Low (check one)

EXPLAIN THE REASONING BEHIND THIS EVALUATION.

The information is very reliable as it was obtained from analytical results from analyses performed at an established laboratory.

Block 3 Has this INFORMATION been confirmed? _Yes X No (check one)

IF SO, DESCRIBE THE CONFIRMATION.

Laboratory analyses have not been validated to confirm the results.

Block 4 **Sources of Information:** (check appropriate box(es) and write in source)

No available information	[ ]		Analytical data	[X]	2
Anecdotal	[ ]		Documentation about data	[ ]	
Historical process data	[ ]		Disposal data	[ ]	
Current process data	[ ]		Q.A. data	[ ]	
Areal photographs	[ ]		Safety analysis report	[ ]	
Engineering/site drawings	[ ]		D&D report	[ ]	
Unusual Occurrence Report	[ ]		Initial assessment	[ ]	
Summary documents	[ ]		Well data	[ ]	
Facility SOPs	[ ]		Construction data	[ ]	
OTHER	[ ]				

REFERENCES

1. Daniel, V. E., EG&G Idaho, Inc. Environmental Technology Sampling Logbook, pp. 7-8, 10-12.

2. Data Chem Laboratories, Analytical Report, dated November 13, 1990.

3. EG&G Idaho, Inc. Environmental Chemistry Analytical Report, ROA #117, dated July 10, 1989.

4. EG&G Idaho, Inc. photographs.

5. EG&G Idaho, Inc. Tank Management Program File CFA-740, Ted Evans, Manager.

6. Goodwin, P. T., personal communication, November 12, 1991.

7. Hood, D. N., personal communication, November 7, 1991.

8. Hood, D. N., personal communication, November 14, 1991.

9. Installation Assessment for EG&G Idaho Operations at the INEL, EGG-WM-6875, January 1986.

10. Ludl, K. M., Sampling and Analysis Plan for Site Assessment During the Closure or Replacement of Nonradioactive Underground Storage Tanks, EGG-WM-9554, April 1991.

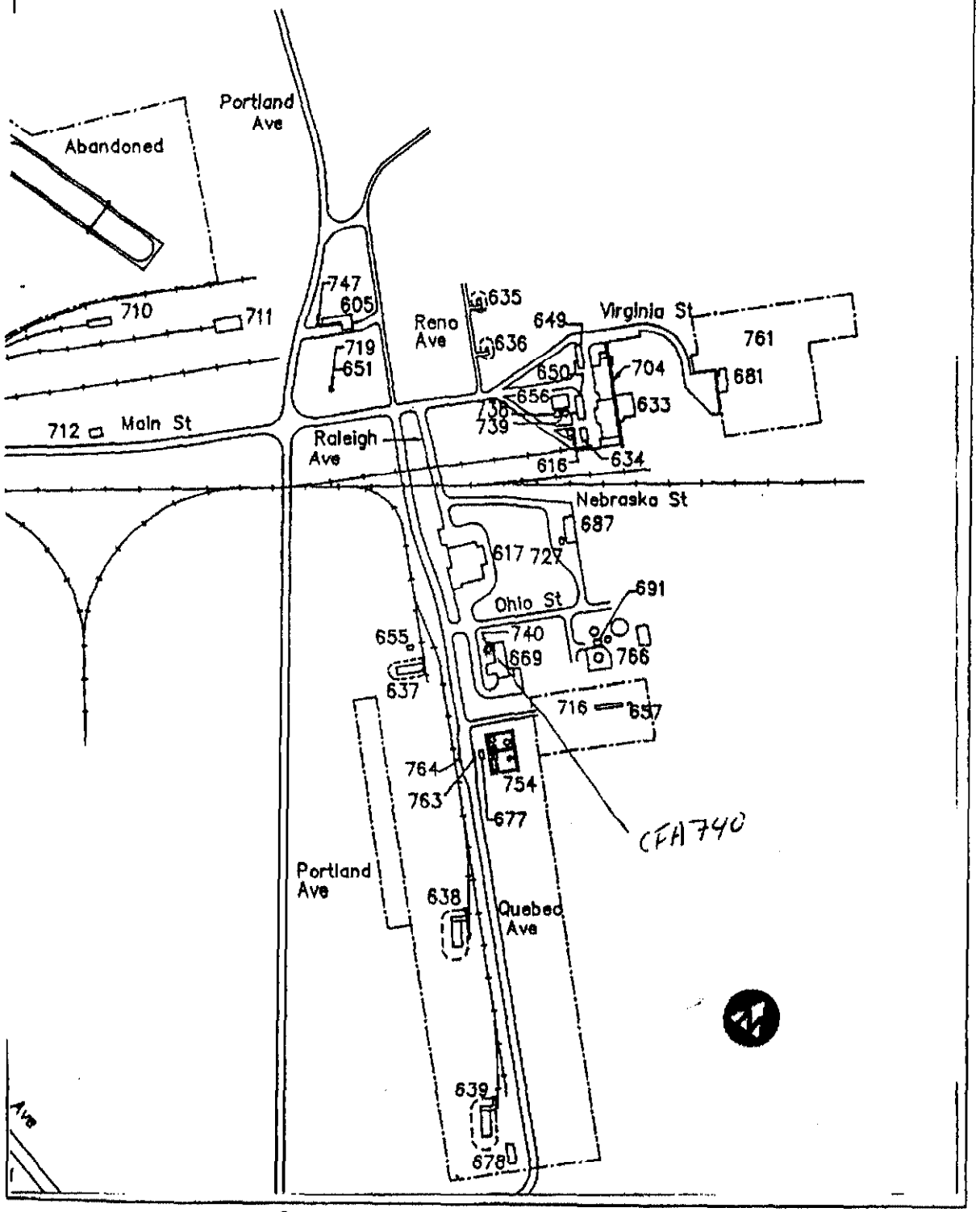
11. Ludl, K. M., Tank Removal Summary for CFA-740, February 1, 1991.

12. Permann, P. J., EG&G Idaho, Inc. Environmental Science & Technology Sampling Logbook, pp. 0058, 0060.

13. Rood, A. S., Estimation of Volume of Contaminated Soil from a Fuel Oil Spill, August 7, 1991.

FIELD SKETCH OF TANK LOCATION

Include North Arrow and Scale or Dimensions



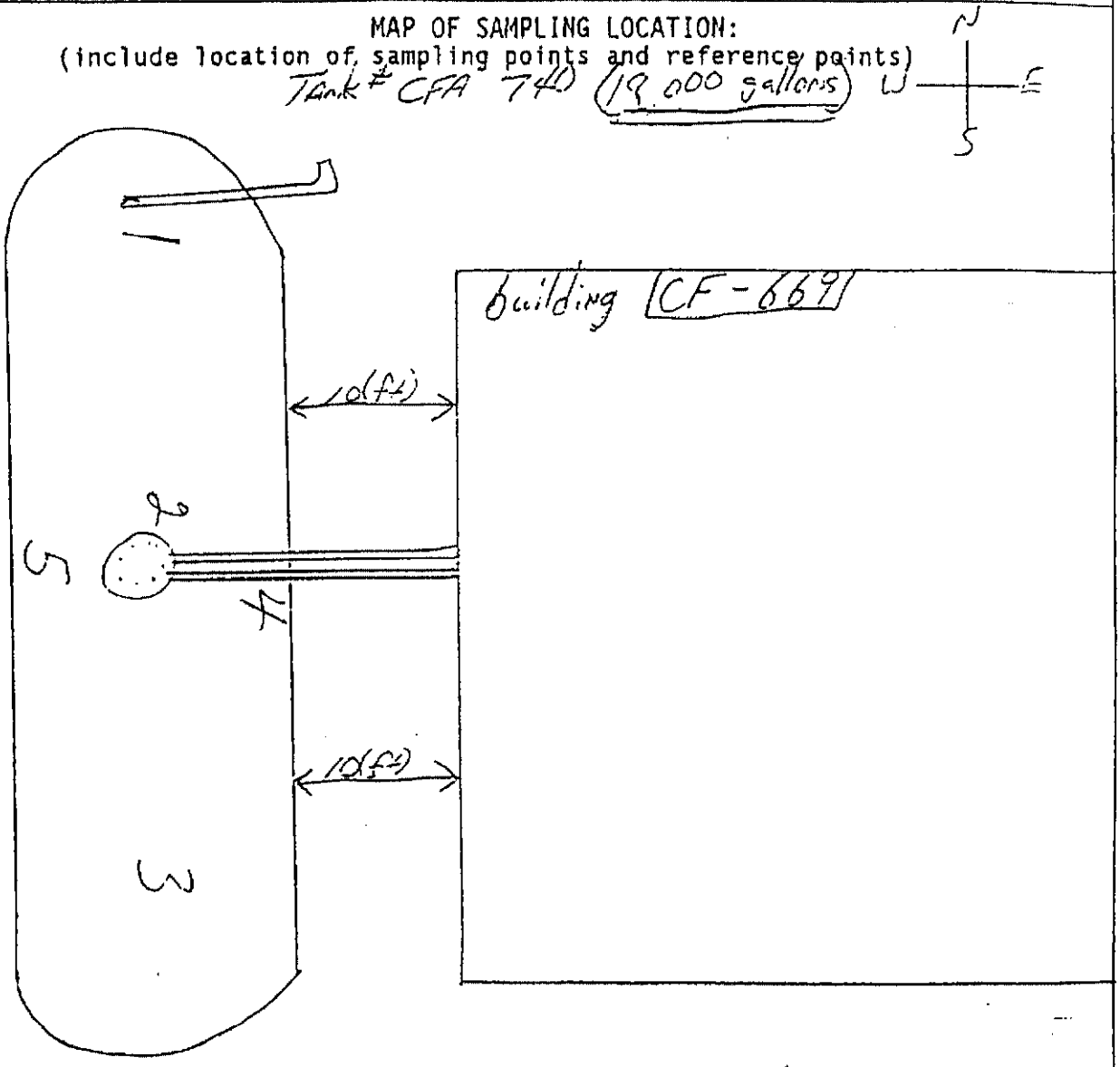
Recorded by: EJ Pomaro Checked By: _____

~~0061~~

20

SAMPLE LOGBOOK

MAP OF SAMPLING LOCATION:
(include location of sampling points and reference points)
Tank # CFA 740 (19,000 gallons)



Note: Number indicate Soil sampling locations

RECORDED BY: Vincent Harris QA CHECK BY: K. Li

ESTIMATION OF VOLUME OF CONTAMINATED SOIL FROM A FUEL OIL SPILL

A. S. ROOD

AUGUST 7, 1991

PROBLEM: What is the volume of contaminated soil which would result from a surface fuel oil spill of a known or estimated quantity?

ASSUMPTIONS:

- N GALLON FUEL SPILL
- SOIL POROSITY = 0.35 (ρ) (Case et al., pg A-62)
- THE RESIDUAL SATURATION CAPACITY (RS) = (0.10, 0.15, 0.20)

The residual saturation for fuel oils is approximately 33% of the water holding capacity of the soil. Dragun (1988) reports maximum RS values for different fuel oils.

Table 1. Residual Saturation (RS) values for different fuels.

Fuel	RS
light oil and gasoline	0.10
diesel and light fuel oil	0.15
lube and heavy fuel oil	0.20

The volume of soil in cubic yards contaminated by a spill is given by (Dragun, 1988)

$$V_s = \frac{0.2 \times V_{HC}}{\rho \times (RS)} \qquad (1)$$

where V_s = Volume of contaminated soil at residual saturation (yd^3).

V_{HC} = volume of discharged hydrocarbons in barrels

= (N gallons of spilled fuel) x (1 barrel per 44 gallons)

ρ = soil porosity

RS = residual saturation from Table 1

The estimated volume in cubic yards contaminated by a light oil or gasoline spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.10}$$

The estimated volume in cubic yards contaminated by a diesel or light fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.15}$$

The estimated volume in cubic yards contaminated by a lube or heavy fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.20}$$

Calculate a volume:

N = 15,000 gallons

RS = 0.20 (from Table 1)

Therefore:

$$V_s = \frac{0.2 \times 15{,}000 / 44}{0.35 \times 0.20} = 974 \text{ cubic yards of contaminated soil}$$

$= 970\ yd^3$

References:

Case, M. J., Maheras, S. J. et al., Radioactive Waste Management Complex Performance Assessment. EG&G Idaho Informal Report, EGG-WM-8773, June, 1990, Page A-62

Dragun, James, Soil Chemistry of Hazardous Materials. Hazardous Materials Control Research Institute, Chapter 2, 1988.

ESTIMATION OF VOLUME OF CONTAMINATED SOIL FROM A FUEL OIL SPILL

A. S. ROOD

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PROBLEM: What is the volume of contaminated soil which would result from a surface fuel oil spill of a known or estimated quantity?

ASSUMPTIONS:

- N GALLON FUEL SPILL
- SOIL POROSITY = 0.35 (ρ) (Case et al., pg A-62)
- THE RESIDUAL SATURATION CAPACITY (RS) = { 0.10, 0.15, 0.20 }

The residual saturation for fuel oils is approximately 33% of the water holding capacity of the soil. Dragun (1988) reports maximum RS values for different fuel oils.

Table 1. Residual Saturation (RS) values for different fuels.

Fuel	RS
light oil and gasoline	0.10
diesel and light fuel oil	0.15
lube and heavy fuel oil	0.20

The volume of soil in cubic yards contaminated by a spill is given by (Dragun, 1988)

$$V_s = \frac{0.2 \times V_{sc}}{\rho \times (RS)} \qquad (1)$$

where V_s = Volume of contaminated soil at residual saturation (yd^3).

V_{sc} = volume of discharged hydrocarbons in barrels

= (N gallons of spilled fuel) x (1 barrel per 44 gallons)

ρ = soil porosity

RS = residual saturation from Table 1

The estimated volume in cubic yards contaminated by a light oil or gasoline spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.10}$$

The estimated volume in cubic yards contaminated by a diesel or light fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.15}$$

The estimated volume in cubic yards contaminated by a lube or heavy fuel oil spill is given by:

$$V_s = \frac{0.2 \times N/44}{0.35 \times 0.20}$$

Calculate a volume:

N = 15,000 gallons

RS = 0.15 (from Table 1)

Therefore:

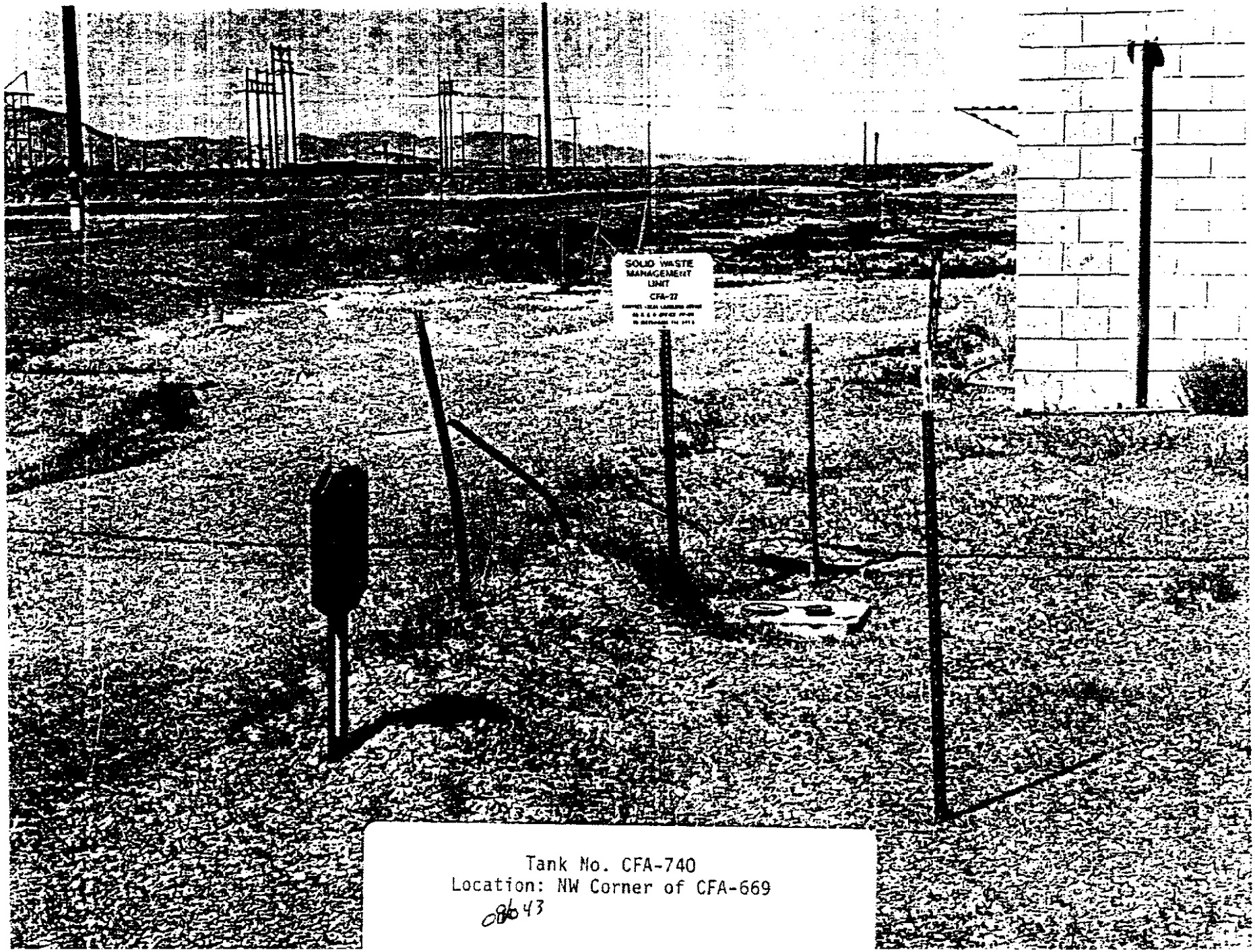
$$V_s = \frac{0.2 \times 15{,}000 / 44}{0.35 \times 0.15} = 1{,}298 \text{ cubic yards of contaminated soil}$$

$= 1{,}300 \text{ yd}^3$

References:

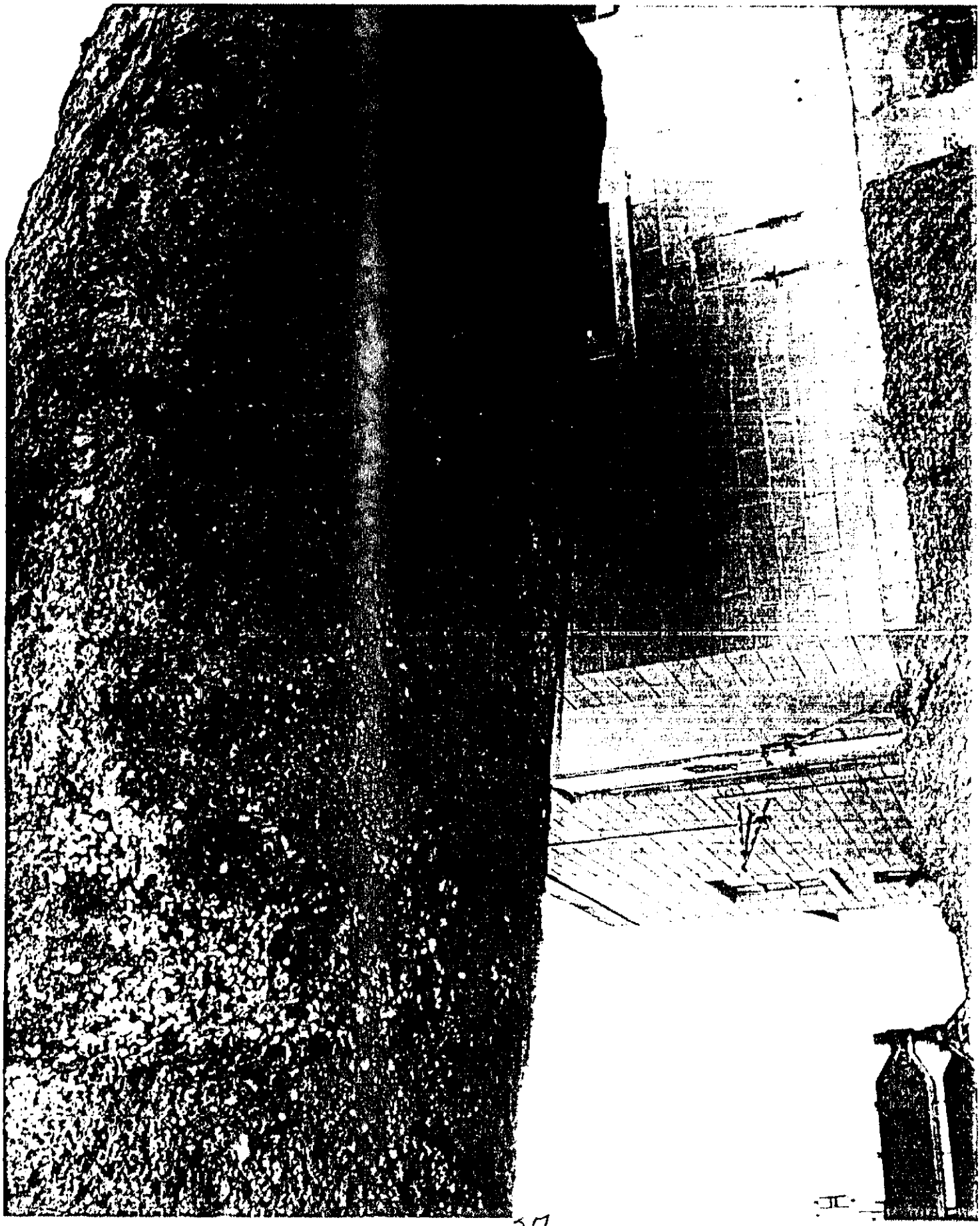
Case, M. J., Maheras, S. J. et al., Radioactive Waste Management Complex Performance Assessment. EG&G Idaho Informal Report, EGG-WM-8773, June, 1990, Page A-62

Dragun, James, Soil Chemistry of Hazardous Materials. Hazardous Materials Control Research Institute, Chapter 2, 1988.



Tank No. CFA-740
Location: NW Corner of CFA-669

0643




CFA 740